

REDRING®

LWSS STAINLESS STEEL UNVENTED WATER STORAGE HEATER

INSTALLATION

COMMISSIONING

MAINTENANCE



WRAS
APPROVED
PRODUCT

THIS UNIT IS SUPPLIED BY

**APPLIED ENERGY PRODUCTS LTD
TEL: 08709 000430**

APPLIED ENERGY PRODUCTS LTD

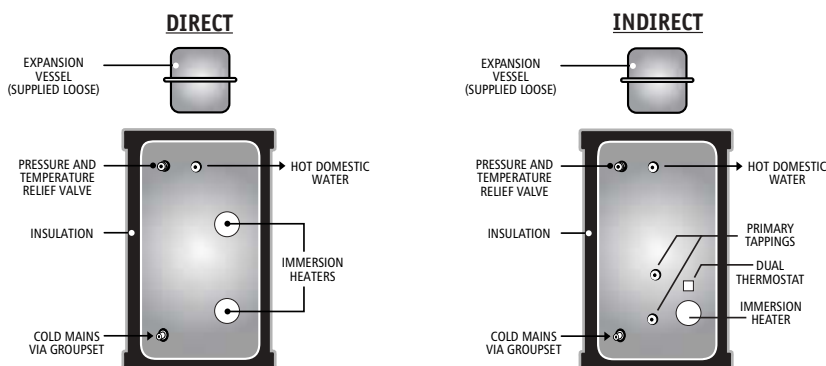
STAINLESS STEEL UNVENTED HOT WATER STORAGE UNITS

Please read the following carefully before installation of the product. You should be competent to install the unvented system as defined by the regulations. Special attention must be paid to maintenance and service.

Please keep the unit packaged until you are ready to commence installation. Store the unit in a dry area, keep it vertical and ensure that all safety components are kept in the box.

IT IS A REQUIREMENT THAT THIS UNIT IS SERVICED AND MAINTAINED ANNUALLY – THE BENCHMARK LOG BOOK MUST BE COMPLETED AND UPDATED. FAILURE TO DO SO WILL INVALIDATE GUARANTEES.

THE DIRECT & INDIRECT UNITS



INSTALLING THE LWSS UNIT

Choose a flat even surface. Wooden bearers are not essential as the unit sits on a ring stand. The unit must be installed vertically.

Please install in an area that will be accessible in the future. When first fixing take into account that the connections and controls will be front facing to facilitate access.

Check that the floor will support the unit when it is full of water. See page 14 for weights.

COLD FEED

Minimum mains pipework of 25mm MDPE or 22mm copper is advised. If 15mm copper or 1/2" lead is the only mains feed then the decision to install rests with the installer or specifier of the product. Flow rates will be compromised, even at appropriate pressures, ensure that you have at least 18 litres per minute at the bath tap. Maximum inlet pressure is 12 bar.

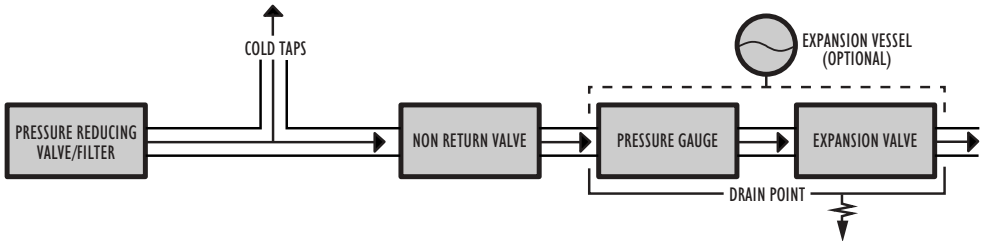
If multiple bath filling or showering is required, mains feed may need to be 32mm MDPE or 28mm copper.

The unit operates at 3 bar and pressures from 2 bar upwards are suitable. Lower pressure will result in a fall in flow rate. A flow rate of 20 litres per minute is a minimum requirement for single bath applications and must rise proportionately for greater demands.

Please also take into account any fitting that could restrict flow such as water meters, softeners etc.

Connection to the unit – Use 22mm compression for all connections. Use gunmetal, DZR or brass fittings, noting local water conditions.

COLD MAINS COMPONENT LAYOUT



No valve is to be fitted between the expansion valve and the cylinder, except a drain point.

It is recommended that a stop cock is fitted to the above to facilitate servicing. Install before the pressure reducing valve. Always fit a drain tap in an appropriate position for drain down as low as possible.

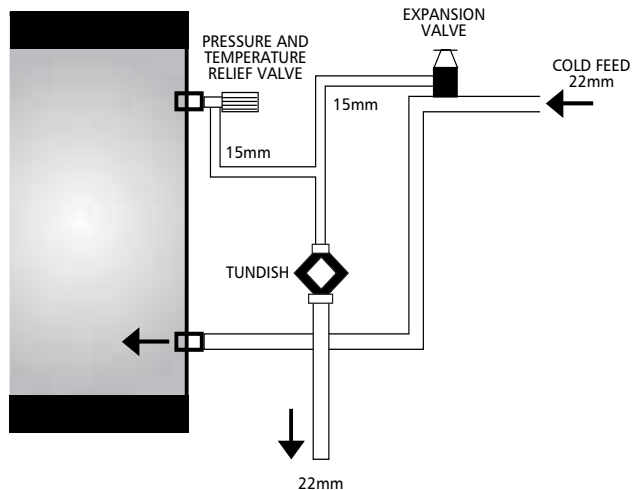
DON'T USE MONOBLOC MIXERS IF THE COLD SERVICE IS UNEQUALISED AS IT WILL BACK – PRESSURISE THE UNIT AND RESULT IN DISCHARGE.

DISCHARGE

Both the pressure and temperature relief valve fitted to the unit and the expansion valve supplied loose must be arranged to comply with G3 regulations and each discharge into an open (visible) tundish.

A 300mm vertical drop of 22mm diameter pipe must be fitted to the tundish.

NB: THE TUNDISH AND DRAIN MUST BE POSITIONED AWAY FROM ELECTRICAL DEVICES.



ALWAYS CONSULT THE REGULATIONS!

IMPORTANT: Discharge arrangements are the responsibility of the installer and reference to current building regulations should always be made. Applied Energy Products Ltd. offers the foregoing as guidelines only.

The main purpose of discharge pipework is to allow full flow from relief valves to be accumulated and safely routed to a point outside the building at low level.

GUIDANCE NOTES

TUNDISH DISCHARGE

The unit is supplied with two mechanical safety devices. An expansion relief valve, supplied loose, and a temperature/pressure relief valve fitted to the unit, both discharging into a tundish (supplied loose).

Discharge pipes must be left open to atmosphere, not blocking the tundish.

The responsibility for supplying and fitting the discharge pipe from the tundish is that of the certified installer. In general, installation practice should be in accordance with the approved document G3 of schedule 1 of the building regulations 1991, VIZ:

- 3.9 The discharge pipe from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge, be of metal and:
- a Be at least one pipe size larger than the nominal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long i.e discharge pipes between 9m and 18m equivalent resistance length should be at least larger than the nominal outlet size of the safety device, between 18m and 27m at least 3 sizes larger, and so on. Bends must taken into account in calculating the flow resistance. See Diagram and table on page 6.
 - b Have a vertical section of pipe at least 300mm long, below the tundish before any elbows or bends in the pipework.
 - c Be installed with a continuous fall.
 - d Have discharges visible at both the tundish and the final point of discharge but where this is not possible or practically difficult there should be clear visibility at one or other of these locations. Examples of acceptance discharge arrangements are:
 - d.1 Ideally below a fixed grating and above the water seal in a trapped gully.
 - d.2 Downward discharges at a low level; i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc. are acceptable providing that where children may play or otherwise come into contact with discharges, a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility.

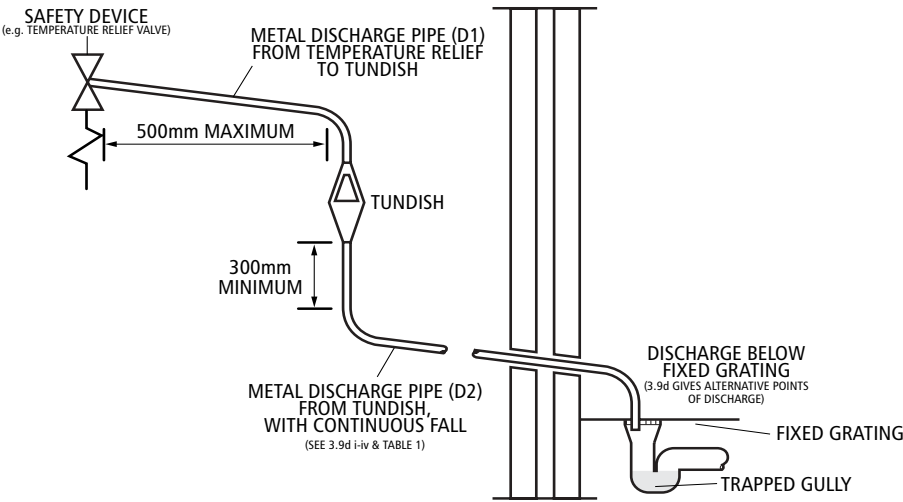
Continued...

GUIDANCE NOTES

- d.3 Discharges at high level; e.g. in to metal hopper and metal down pipe with the end of the discharge pipe clearly visible (tundish visible or not) or onto a roof capable of withstanding high temperature discharges of water and 3m from any plastic guttering systems that would collect such discharges (tundish visible).
- d.4 Where a single pipe serves number of discharges, such as in a block of flats, the number served should be limited to not more than 6 systems so that any installation can be traced reasonably easily. The single common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe to be connected. If unvented hot water storage systems are installed where discharges from safety devices may not be apparent i.e. in dwellings occupied by blind, infirm or disabled people, consideration should be given to the installation of an electronically operated device to warn when discharge takes place.

NOTE: The discharge will consist of scalding water and steam. Asphalt, roofing felt and non-metallic rainwater goods may be damaged by such discharges.

GUIDANCE NOTES - TYPICAL DISCHARGE PIPE ARRANGEMENT



SIZING OF D2 COPPER DISCHARGE PIPE FOR COMMON TEMPERATURE RELIEF VALVE OUTLET SIZES

VALVE OUTLET SIZE	MINIMUM SIZE OF DISCHARGE PIPE (D1)	MINIMUM SIZE OF DISCHARGE PIPE (D2) FROM TUNDISH	MAXIMUM RESISTANCE ALLOWED, EXPRESSED AS A LENGTH OF STRAIGHT PIPE (I.E. NO ELBOWS OR BENDS)	RESISTANCE CREATED BY EACH ELBOW OR BEND
$G^{1/2}$	15mm	22mm	up to 9m	0.8m
		28mm	up to 18m	1.0m
		35mm	up to 27m	1.4m
$G^{3/4}$	22mm	28mm	up to 9m	1.0m
		35mm	up to 18m	1.4m
		42mm	up to 27m	1.7m
G1	28mm	35mm	up to 9m	1.4m
		42mm	up to 18m	1.7m
		54mm	up to 27m	2.3m

WORKED EXAMPLE:

The example below is for a G¹/₂ temperature relief valve with a discharge pipe (D2) having 4 No. elbows and length of 7m from the tundish to the point of discharge.

From Table 1

- Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G¹/₂ temperature relief valve is 9.0m.
- Subtract the resistance for 4 No. 22mm elbows at 0.8m each = 3.2m
- Therefore the maximum permitted length equates to 5.8m.
- 5.8m is less than the actual length of 7m therefore calculate the next largest size.
- Maximum resistance allowed for a straight length of 28mm pipe (D2) from a G¹/₂ temperature relief valve equates to 18m.
- Subtract the resistance for 4 No. 28mm elbows at 1.0m each = 4.0m
- Therefore the maximum permitted length equates to 14m.
- As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory

INSTALLATION

HOT WATER OUTLETS

Dynamic pressure always drops across a system when more than one outlet is opened.

The unit has a working pressure of 3 bar.

Good system design should take this into consideration & pipe sizing should be in line with current good practice.

In hard water areas a reduced operating temperature will help to prevent premature scaling.

EXPANSION VESSEL

The vessel (supplied loose) screws onto the top of the unit. It is sized appropriately and includes some allowance for pipework. Check the charge is at 3.0 bar before commissioning.

The expansion vessel can also be fitted remotely between the unit and the check valve on the cold supply or by adaptor to the top female fitting on the cylinder.

PRIMARY CIRCUITS

The maximum primary pressure is 3.5 bar.

The boiler must have a mechanical high-limit thermostat.

Solid fuel boilers cannot be used

If the primary circuit is sealed, an additional expansion vessel must be fitted.

If a secondary circuit is connected an additional expansion vessel may be required.

ELECTRICAL CONNECTIONS

Immersion heaters are rated 3kw at 240v (2.76kw at 230v), incolloy elements, with a thermal energy cut-out, and must be connected via double pole switches with a 3mm contact gap separation. Appropriate wiring for the electrical load must be used. The twin immersion heaters supplied with direct units can be switched to utilise low tariff electricity supply. Do not switch on until the unit is full of water.

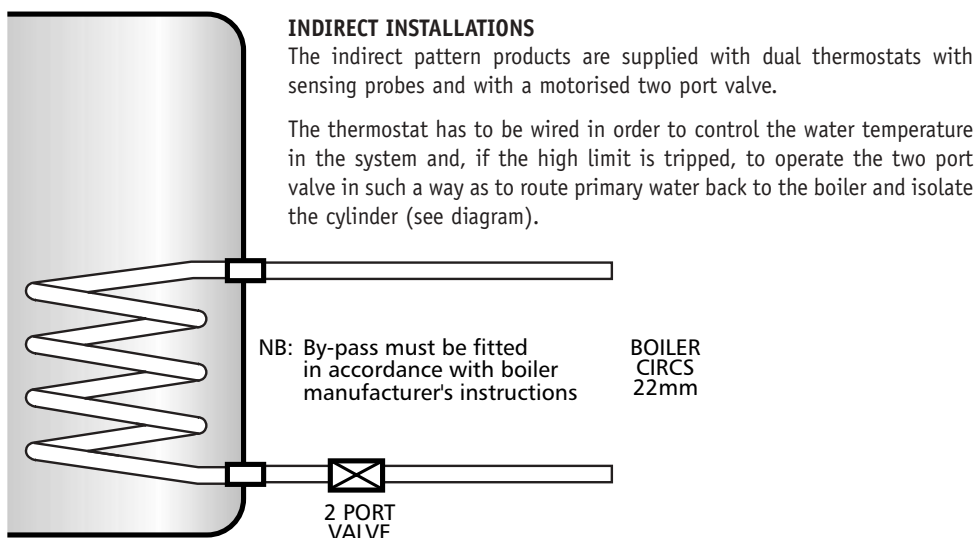
Immersion heaters are supplied fitted in the body of the unit. Always ensure that the joints are watertight on commissioning. The thread is non-standard. Order replacements using reference number on page 14. Do not fit an immersion heater without a high limit thermostat. Immersion heaters fitted are designed for domestic use only, either utilising low tariff electricity and occasional boost or for switched periods during the day.

Immersion heaters must meet BS EN 60730-2-1.

Units must be earth bonded.

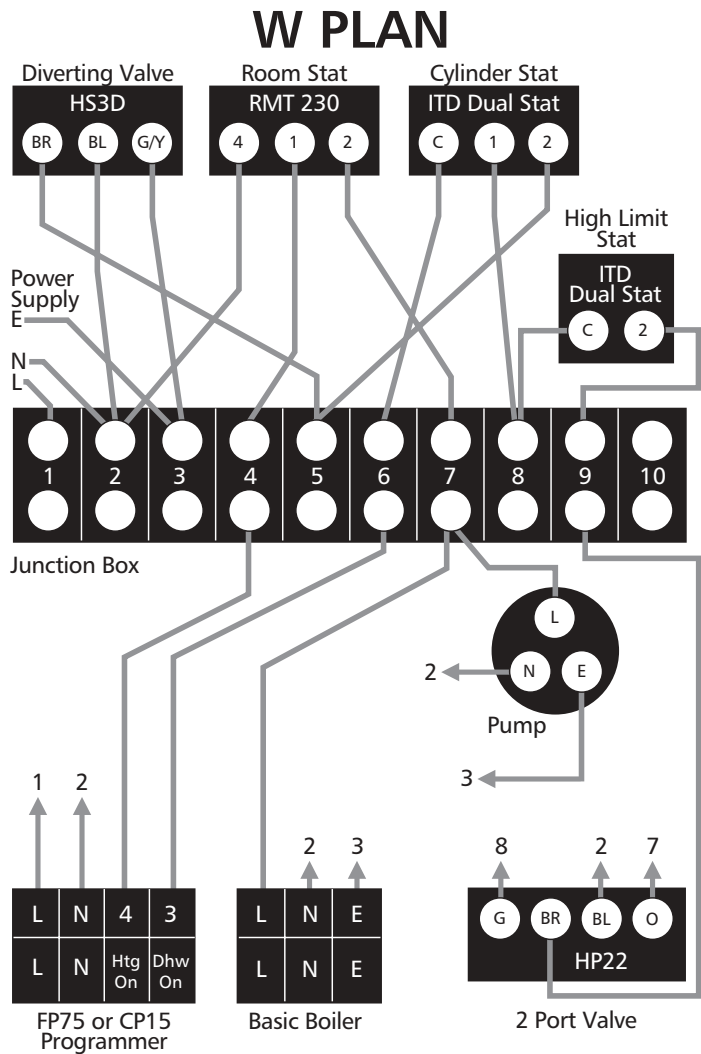
The fuse rating for 6kw loading is 25 amps, for the 3kw (indirect) model the fuse rating is 13 amps.

ALWAYS CONSULT THE REGULATIONS!



WIRING INSTALLATION

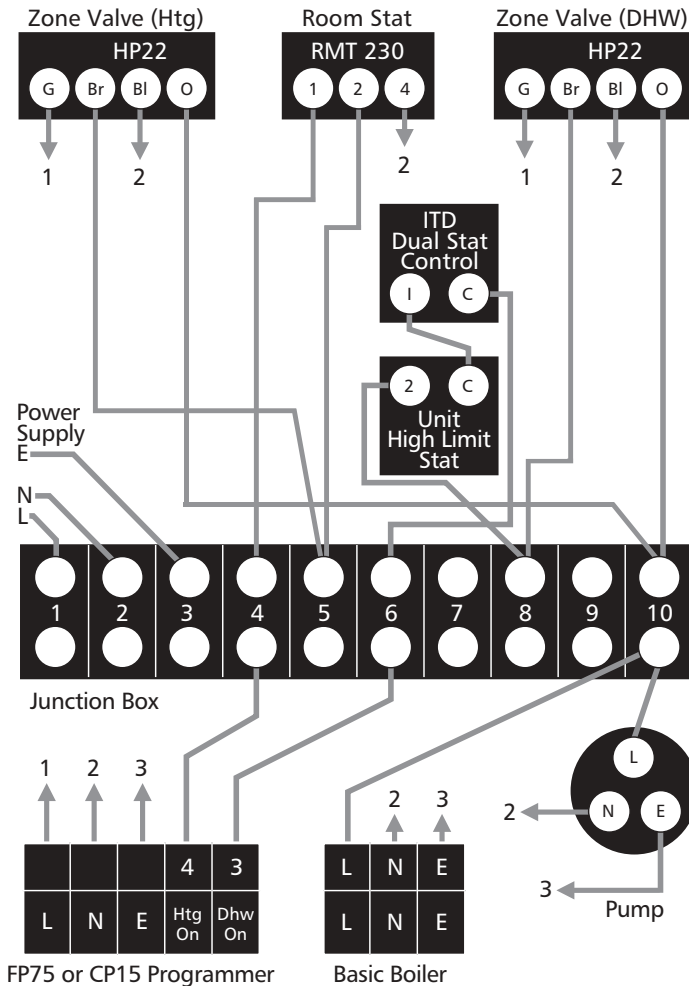
The wiring diagram for Danfoss systems is given as guidance.
For modified Danfoss Randall Y, S and W plan systems when used in conjunction with unvented water storage systems.
Programmers recommended are: FP715 (7,5 and 2 day programming and the CP15 5, 2 and 24 hour programming.



WIRING INSTALLATION

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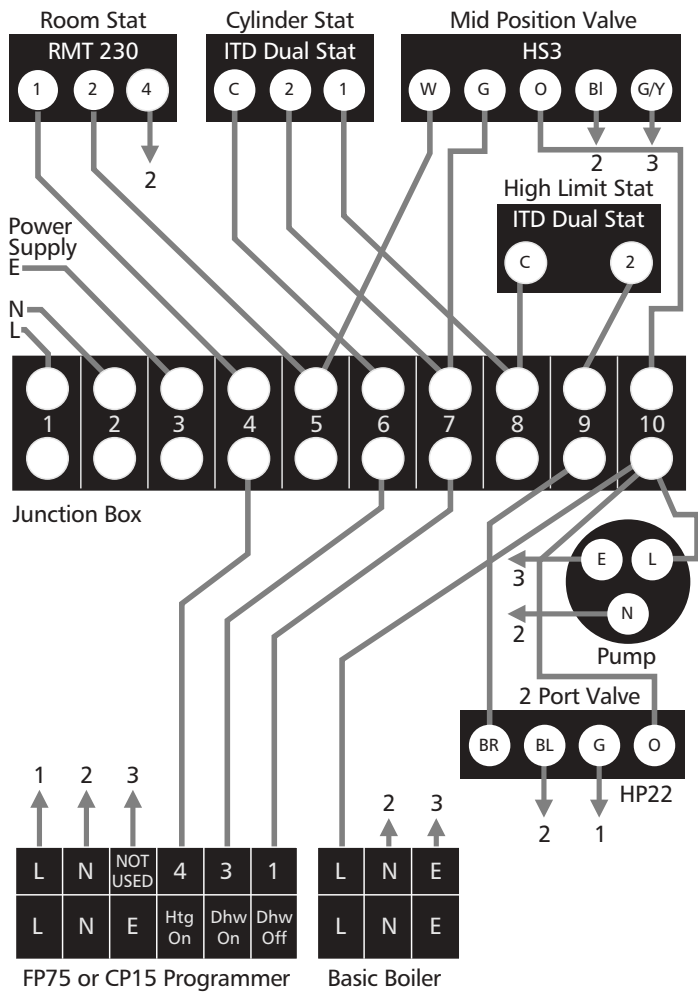
S PLAN



WIRING INSTALLATION

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Y PLAN



COMMISSIONING INSTRUCTIONS

BEFORE FILLING, CHECK EXPANSION VESSEL CHARGE IS AT 3.0 BAR.

1. Open all terminal fittings on the domestic hot water circuit. Open the main supply to the unit.
2. Flush through until all air is expelled.
3. Close hot outlets and open all cold outlets connected to the tee after the pressure control valve.
4. Flush through until all air is expelled.
5. The system is now full of water. Check for any leaks on pipework or joints or components such as immersion heaters etc. It is the responsibility of the installer to check all fittings, including those that are fitted to the unit.
6. Switch on power and heat up via immersion heater, and/or boiler.
7. Your system should be ready for use.

MAINTENANCE

Maintain annually and carry out the following checks:

Clearly up date the Benchmark Log Book at each service -

GUARANTEES ARE VOID WITHOUT SERVICE RECORDS.

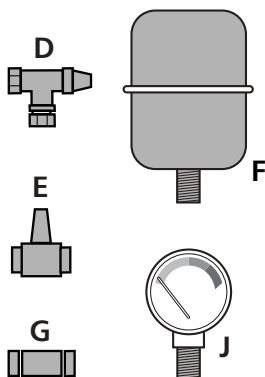
1. Check incoming pressure is controlled at 3 bar maximum. The gauge reading clearly demonstrates this. Expansion vessels must be maintained annually. The charge should be checked with an accurate pressure gauge and maintained at 3.0 bar. If the reading is less than 3.0 bar to recharge the vessel ensure that the unit is decommissioned by turning off the water supply and opening hot tap. Open the pressure and temperature relief valve to drain water from the top of the unit then close this valve. Leaving the hot tap open and the main supply off, pump the vessel using a schraeder valve connector via a footpump or motorised pump to 3.0 bar. Remove pump, open mains supply and close hot tap once water is running freely.

Run a hot tap and close. If the pressure remains over 3 bar, re-calibrate the Pressure Reducing Valve and clean the strainer, replacing if necessary.

2. Open the expansion valve cap to manually discharge water to ensure that it works, making sure that it resets correctly.
3. Open the pressure and temperature relief valve cap to manually discharge water to ensure that it works, making sure that it resets correctly.
4. In both cases ensure that discharge pipework is adequate to safely carry discharged water away. If not, check for blockages etc. and clear.
5. Check that the controls of the hot water temperature do not allow the water to get hotter than 60°C.

STAINLESS INDIRECT UNIT WITH COMPONENT I.D.

$\frac{3}{4}$ " Female boss for
expansion vessel

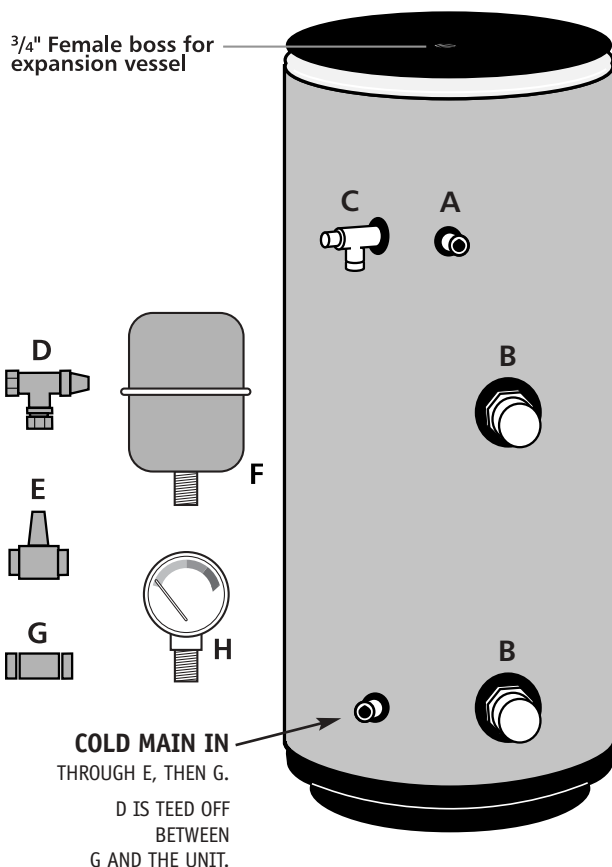


COLD MAIN IN
THROUGH E, THEN G.

D IS TEED OFF
BETWEEN
G AND THE UNIT.

- A HOT DRAW-OFF TO TAPS.
- B 3 KW IMMERSION HEATER WITH MANUAL RE-SET TEMPERATURE HIGH LIMIT CUT-OUT.
- C TEMPERATURE AND PRESSURE RELIEF VALVE.
- D EXPANSION RELIEF VALVE.
- E PRESSURE REDUCING VALVE/LINE STRAINER.
- F EXPANSION VESSEL (SUPPLIED LOOSE).
- G NON RETURN VALVE.
- H PRIMARY CONNECTIONS.
- I IMMERSION THERMOSTAT WITH HIGH LIMIT CUT-OUT.
- J GAUGE.

STAINLESS DIRECT UNIT WITH COMPONENT I.D.



- A HOT DRAW-OFF TO TAPS.
- B 3 KW IMMERSION HEATER WITH MANUAL RE-SET TEMPERATURE HIGH LIMIT CUT-OUT.
- C TEMPERATURE AND PRESSURE RELIEF VALVE.
- D EXPANSION RELIEF VALVE.
- E PRESSURE REDUCING VALVE/LINE STRAINER.
- F EXPANSION VESSEL (SUPPLIED LOOSE).
- G NON RETURN VALVE.
- H GAUGE.

SIZING GUIDE & SPECIFICATIONS

SIZING GUIDE

CAPACITY (LITRES)	NOM SIZES	NOM WEIGHT INDIRECT (FULL)	NOM WEIGHT DIRECT (FULL)	INDIRECT APPLICATION HEAT-UP TIME/RE-HEAT TIME	DIRECT APPLICATION HEAT-UP TIME/RE-HEAT TIME
150	1120 x 560	230kg	201kg	TWIN BATH 30mins / 21mins	SINGLE BATH - 3 BED 88mins / 50mins
200	1470 x 560	300kg	266kg	2 BATH & 2 SHOWERS 33mins / 24mins	TWIN BATH 108mins / 63mins
250	1770 x 560	360kg	319kg	3 BATH & 2 SHOWERS 36mins / 26mins	TWIN BATH & SHOWER 155mins / 100mins

Heat-up times through 50°C. Re-heat is 70% of volume.

COMPONENT SPECIFICATION & REFERENCE NUMBERS

DESCRIPTION	SPECIFICATION	PART NUMBER
PRESSURE REDUCING VALVE	3.0 BAR CONTROL	97-392056
NON RETURN VALVE	22MM X 22MM	97-392038
PRESSURE GAUGE	0-10 BAR SCALE	97-392057
EXPANSION VALVE	6.0 BAR	97-392058
PRESSURE & TEMP RELIEF VALVE	7.0 BAR/95°C	97-392059
IMMERSSION HEATER	1 ³ / ₄ ~ 240V ~ 3KW	97-392060
IMMERSSION HIGH LIMIT THERMOSTAT	80°C	97-392061
IMMERSSION CONTROL THERMOSTAT	VARIABLE	97-392062
EXPANSION VESSEL UP TO 170 LITRE MODELS	3.0 BAR CHARGE, 12 LITRE CAPACITY	97-392063
EXPANSION VESSEL FOR 200 & 250 LITRE MODELS	3.0 BAR CHARGE, 18 LITRE CAPACITY	97-392064
TUNDISH	1 ¹ / ₂ " X 22MM	97-392065
INSTALLATION GUIDE	24PP	97-392066
LABEL	-	97-392067
CYLINDER THERMOSTAT	CONTROL & HIGH LIMIT 80°C	97-392068
2 PORT VALVE	DANFOSS	97-392069

GUARANTEE

Applied Energy Products Ltd guarantees the shell of the unit for 25 years. The component parts, including the expansion vessel, are guaranteed for 2 years from date of purchase.

**THE FOLLOWING INFORMATION IS IMPORTANT –
WITHOUT IT YOUR GUARANTEE MAY BE INVALID**

1. Keep proof of purchase
2. Maintain log book on unit
3. Service annually
4. Ensure that installation has been carried out correctly by appropriately approved/ competent personnel following relevant Code of Practice.
5. Installation must be in an appropriate location and use is restricted to potable water.

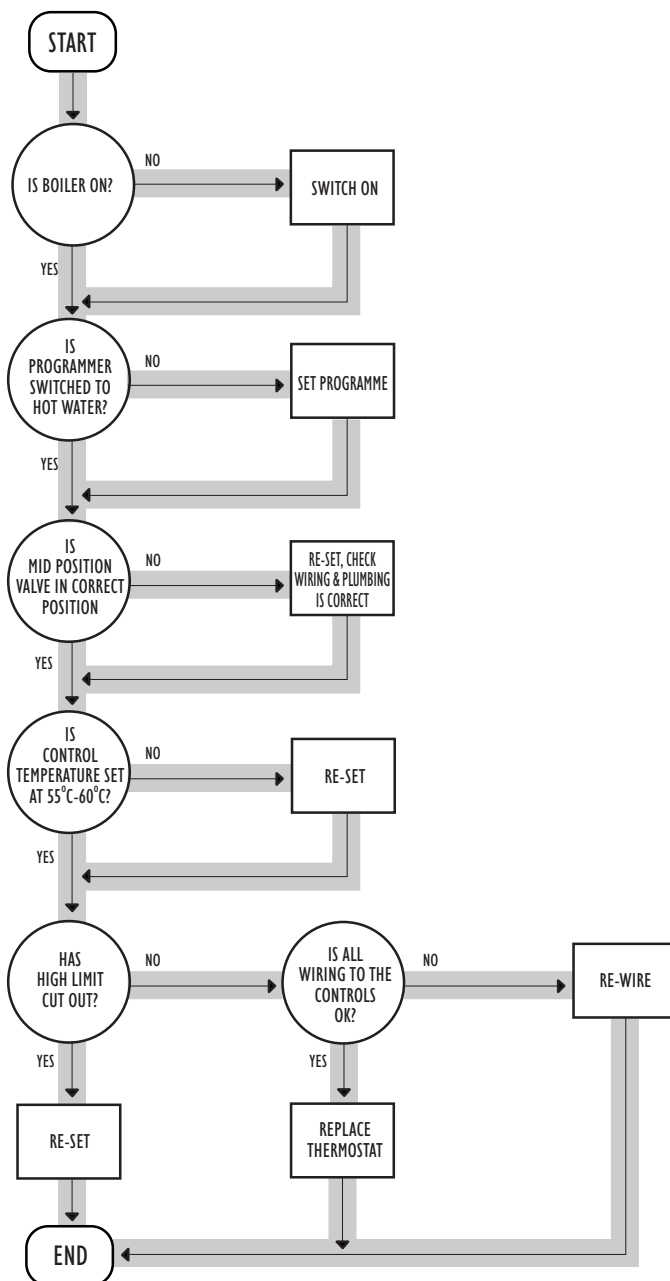
Please note that the extended guarantee is not transferable, and rests with the original householder.

The above does not affect your statutory rights.

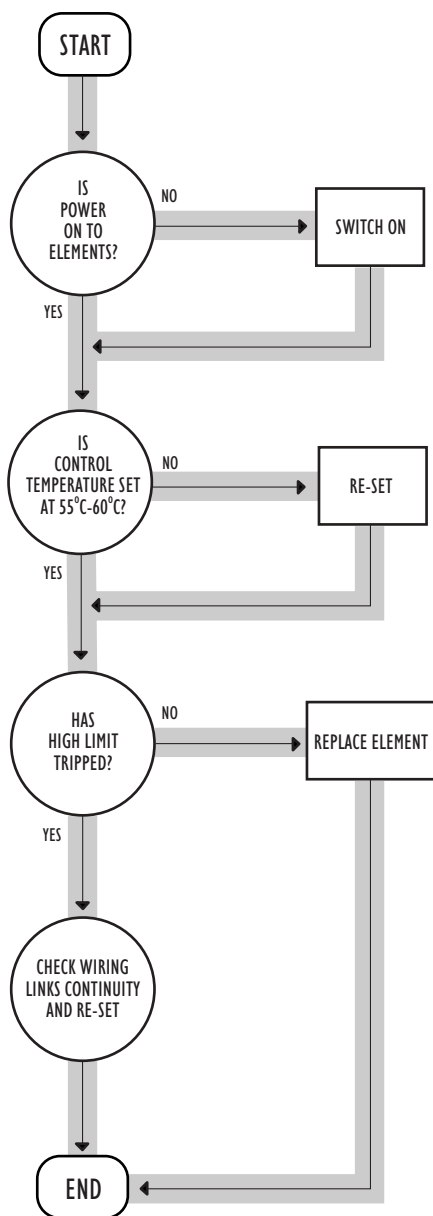
Every effort has been made to ensure that this information is correct. Regulations may change and installers must adopt best current practice.

We reserve the right to alter or improve components or specification without notice. We will endeavour to update web site details as changes happen.

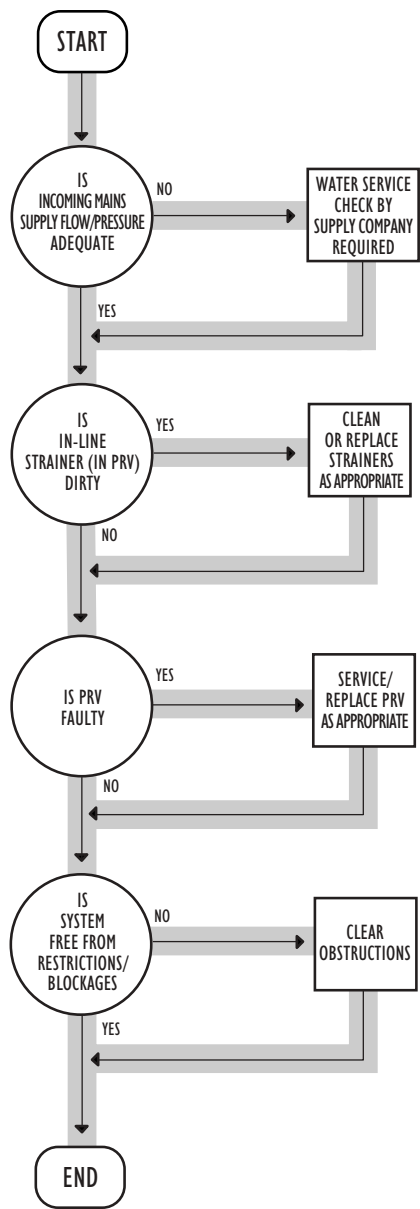
TROUBLESHOOTING - NO HOT WATER - INDIRECT



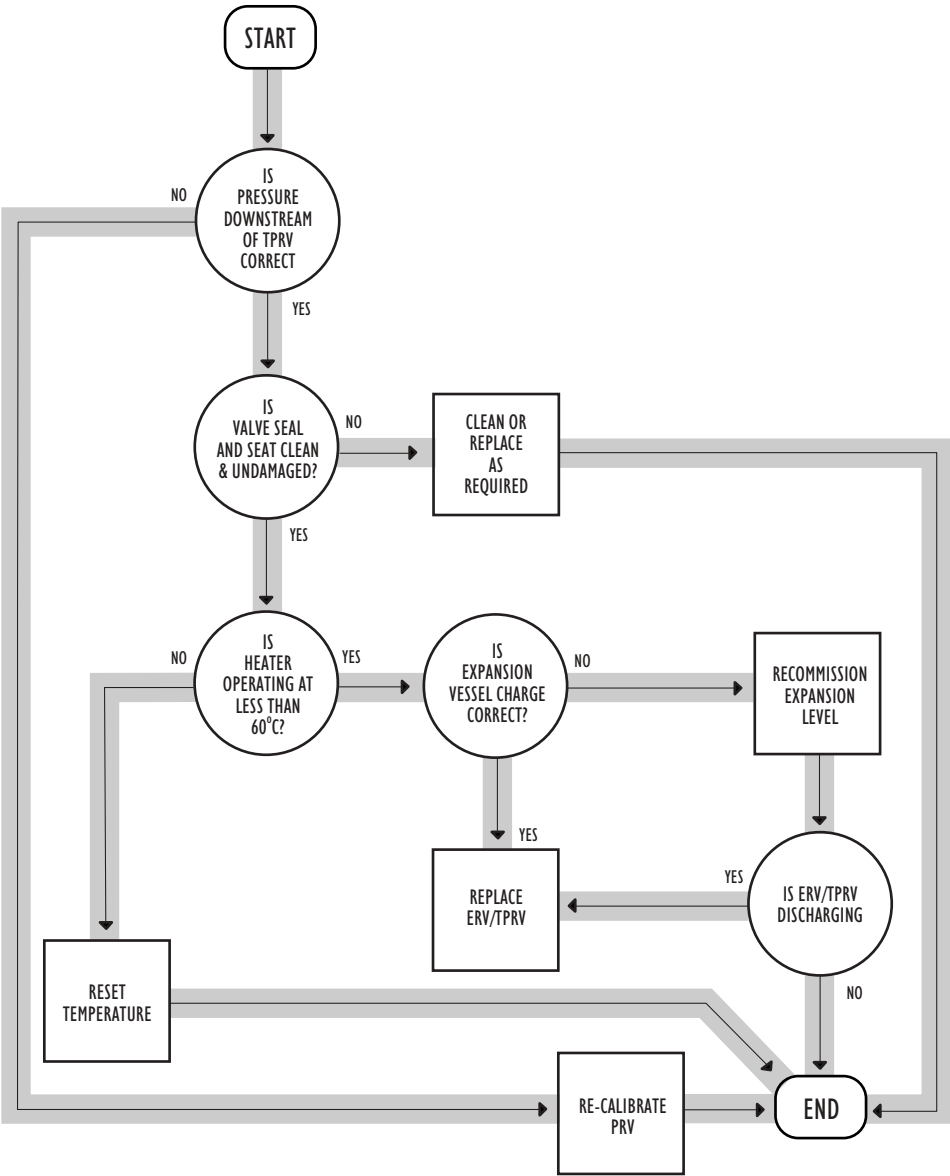
TROUBLESHOOTING - NO HOT WATER - DIRECT



TROUBLESHOOTING - POOR WATER FLOW AT HOT TAPS



TROUBLESHOOTING - WATER DISCHARGING INTO TUNDISH



SERVICE INTERVAL RECORD

It is recommended that your heating system is serviced regularly and that your service engineer completes the appropriate Service Interval Record below.

SERVICE PROVIDER

Before completing the appropriate Service Interval Record below, please ensure you have carried out the service as described in the manufacturer's instructions and in compliance with all the relevant codes of practice.

SERVICE 1 DATE _____

ENGINEER NAME _____

COMPANY NAME _____

TEL No. _____

ID SERIAL No. _____

COMMENTS _____

SIGNATURE _____

SERVICE 2 DATE _____

ENGINEER NAME _____

COMPANY NAME _____

TEL No. _____

ID SERIAL No. _____

COMMENTS _____

SIGNATURE _____

SERVICE 3 DATE _____

ENGINEER NAME _____

COMPANY NAME _____

TEL No. _____

ID SERIAL No. _____

COMMENTS _____

SIGNATURE _____

SERVICE 4 DATE _____

ENGINEER NAME _____

COMPANY NAME _____

TEL No. _____

ID SERIAL No. _____

COMMENTS _____

SIGNATURE _____

SERVICE 5 DATE _____

ENGINEER NAME _____

COMPANY NAME _____

TEL No. _____

ID SERIAL No. _____

COMMENTS _____

SIGNATURE _____

SERVICE 6 DATE _____

ENGINEER NAME _____

COMPANY NAME _____

TEL No. _____

ID SERIAL No. _____

COMMENTS _____

SIGNATURE _____

SERVICE 7 DATE _____

ENGINEER NAME _____

COMPANY NAME _____

TEL No. _____

ID SERIAL No. _____

COMMENTS _____

SIGNATURE _____

SERVICE 8 DATE _____

ENGINEER NAME _____

COMPANY NAME _____

TEL No. _____

ID SERIAL No. _____

COMMENTS _____

SIGNATURE _____

WHEN ALL OF THE ABOVE SERVICE HAVE BEEN COMPLETED, PLEASE CONTACT YOUR SERVICE ENGINEER FOR AN ADDITIONAL SERVICE INTERVAL RECORD SHEET.

COMMISSIONING PROCEDURE INFORMATION

BOILER PRIMARY SETTINGS

IS THE PRIMARY SEALED OR OPEN VENTED SYSTEM? Sealed ☐ Open ☐
IF SEALED THEN WHAT IS THE SYSTEM PRESSURE? Hot _____ Cold _____ BAR
IF SEALED THEN WHAT IS THE CHARGE PRESSURE OF EXPANSION VESSEL? _____ BAR
WHAT IS THE AVAILABLE BOILER FLOW TEMPERATURE? _____ °C
WHAT IS THE BOILER RETURN TEMPERATURE WHEN CYLINDER/STORE IS SATISFIED? _____ °C

BOILER PRIMARY SETTINGS

IS THE VENT PIPE CORRECTLY INSTALLED? YES ☐ NO ☐
WHAT IS THE STATIC HEAD IN METRES? _____ METRES
WHAT IS THE CYLINDER THERMOSTAT SETTING? _____ °C

ALL MAINS PRESSURE SYSTEMS

WHAT IS INCOMING COLD WATER PRESSURE? _____ BAR
HAS STRAINER (IF FITTED) BEEN CLEANED OF INSTALLATION DEBRIS? YES ☐ NO ☐
HAS A WATER TREATMENT DEVICE BEEN FITTED? YES ☐ NO ☐
IF YES TO ABOVE THEN WHAT TYPE? _____

UNVENTED SYSTEMS ONLY

ARE T&P AND EXPANSION VALVES FITTED AND DISCHARGE TESTED? YES ☐ NO ☐
IS PRIMARY ENERGY CUT OUT FITTED (NORMALLY 2 PORT VALVE)? YES ☐ NO ☐
WHAT IS OPERATING PRESSURE (PRV SETTINGS)? _____ BAR
WHERE IS PRV SITUATED? _____
HAS STRAINER (IF FITTED) BEEN CLEANED OF INSTALLATION DEBRIS? YES ☐ NO ☐
HAS EXPANSION VESSEL OR INTERNAL AIR GAP BEEN CHECKED? YES ☐ NO ☐
WHAT IS THE CYLINDER THERMOSTAT SETTING? _____ °C

ALL PRODUCTS

HAS THE SYSTEM BEEN EXPLAINED TO THE HOUSEHOLDER? YES ☐ NO ☐
HAS THE SYSTEMS LITERATURE BEEN LEFT WITH THE HOUSEHOLDER? YES ☐ NO ☐

ENGINEERS SIGNATURE _____ CUSTOMERS SIGNATURE _____

CUSTOMER DETAILS

NAME _____

ADDRESS _____

TEL No. _____

INSTALLER DETAILS

NAME _____

DATE _____

ADDRESS _____

TEL NO. _____

REGISTRATION DETAILS (Where applicable for unvented systems etc)

REG No. _____

ID SERIAL No. etc. _____

COMMISSIONING ENGINEER DETAILS

NAME _____

DATE _____

ADDRESS _____

TEL NO. _____

REGISTRATION DETAILS (Where applicable for unvented systems etc)

REG No. _____

ID SERIAL No. etc. _____

APPLIANCE DETAILS

MANUFACTURER _____

MODEL _____

CAPACITY _____

LITRES

SERIAL NO. _____

GENERAL INSTALLATION

HAS A CHECK BEEN DONE FOR JOINT TIGHTNESS AND LEAKS?

YES ☐

NO

HAS A CHECK BEEN DONE FOR ELECTRICAL SAFETY?

YES ☐

NO



is supported by



WATERHEATER
MANUFACTURERS
ASSOCIATION

Storage Waterheater Installation, Commissioning and Service Record Log Book

(To be retained by customer).

INSTALLER DETAILS

APPLIANCE DETAILS

COMMISSIONING RECORDS

SERVICE INTERVAL RECORD

IMPORTANT

**FAILURE TO INSTALL & COMMISSION THIS APPLIANCE TO THE
MANUFACTURER'S INSTRUCTIONS MAY INVALIDATE THE WARRANTY**
This note does not affect your statutory rights.